

PROPER CARE OF YOUR HAND SAWS!



PORTER

DISSTON DIVISION
H. K. PORTER AUSTRALIA PTY. LTD.



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DISSTON

Superior Quality **HAND SAWS**



In the Tradition of Fine Saw Making

Disston saws have enjoyed overwhelming popularity amongst tradesmen for generations. The traditions and ideals set down by the founder are diligently maintained in the Australian manufacture.

Subjected to critical examination and test, every saw leaving the Disston works is of the same high standard that has made the name of Henry Disston famous throughout the world. That is why we guarantee all our products against faulty material and workmanship.



THE CROSS-CUT SAW

The cross-cut saw is used for cutting across the grain, and has a different cutting action from that of the rip saw. The teeth cut like sharp-pointed knives. They are also made with more points to the inch than the rip saw.

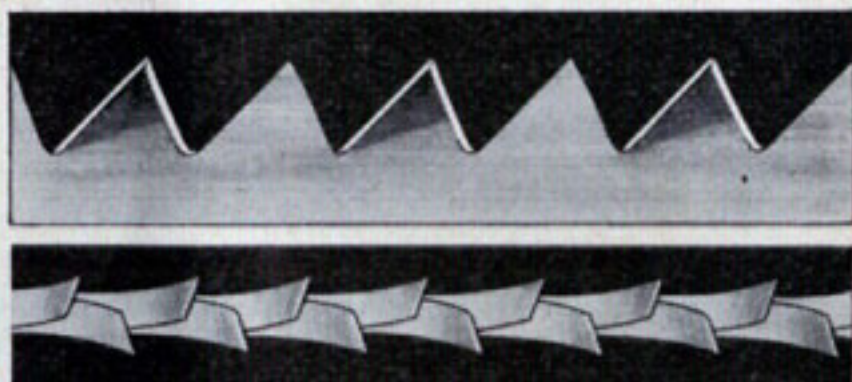
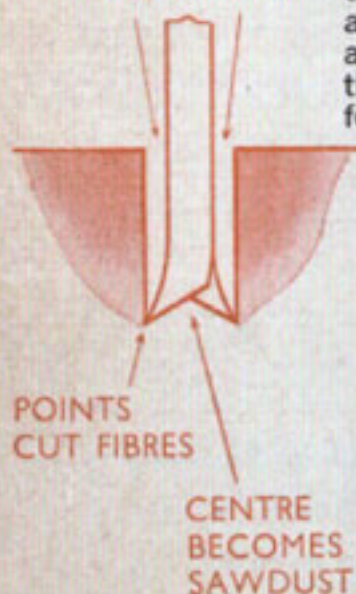
Unless the blade of a cross-cut saw is made of high grade steel, the teeth quickly lose their keen-cutting quality. When selecting a hand saw, cross-cut or rip, "It is best to get one with a name on it which has a reputation"—quoted from the founder, Henry Disston.

The included angle of a cross-cut saw tooth is 60° , the same as that of a rip saw. The angle on front of the tooth is 15° from the perpendicular, while the angle on the back is 45° .

The teeth are filed with a bevel of about 24° . The upper half of each tooth is set, alternately, one to the right, the next to the left, to assure clearance. The true taper grind of Disston Top Quality Hand Saws gives them additional clearance, and makes them run more easily and more accurately with less set than saws ground in the ordinary manner. Also, it helps to keep saws sharp for a longer time.

THE CROSS-CUT SAW TOOTH

CLEARANCE
MADE BY SET



CROSS-CUT SAW

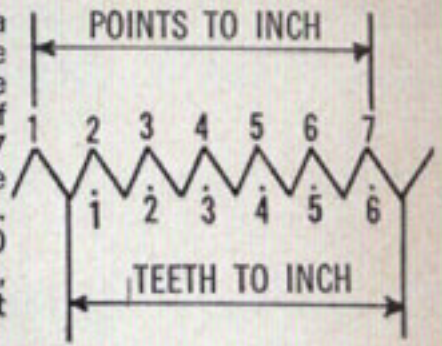
1. Side view of teeth showing bevels and points.
2. Top view of teeth.

PURPOSE OF SET

The purpose of setting the teeth of saws, that is, springing over the upper part of each tooth (not more than the half of the tooth nearest the point), one to the right, the next to the left, and so on alternately throughout the entire tooth edge, is to make the saw cut a kerf slightly wider than the thickness of the blade. This gives clearance and prevents friction which would cause the saw to bind and push hard in the cut.

POINTS TO THE INCH

Points to the inch is a term used to designate the size of teeth in a saw. The saw with a small number of tooth points to the inch, 7 points for example, will make a rough cut, yet cut fast. Saws with more points, say 10 or more, will make smooth, even cuts, but not cut as fast as the coarse tooth saw.



LENGTH OF BLADE

The length of either rip or cross-cut hand saws is measured from point to butt on the cutting edge. Cross-cut saws are made in different lengths.



THE RIP SAW

The rip saw is used for cutting with the grain. Teeth differ from those of a cross-cut saw in size and shape. The rip saw has fewer teeth, or points, to the inch, hence they are larger. The angle of a rip tooth is 8° from the perpendicular. The cutting edges are square instead of bevelled. Although both types of saws are interchangeable to some extent, each should be used specifically for the kind of work for which it is designed.

THE RIP SAW TOOTH

A tooth of a rip saw has an included angle of 60° - 8° from the perpendicular on the front, and 52° on the back.

The tooth resembles a small chisel, and its cutting action is much the same, each tooth chipping out a small portion of the wood from the kerf. Cutting is done by the forward stroke. The upper half of each tooth is set alternately, one to the left and one to the right, to



RIP SAW

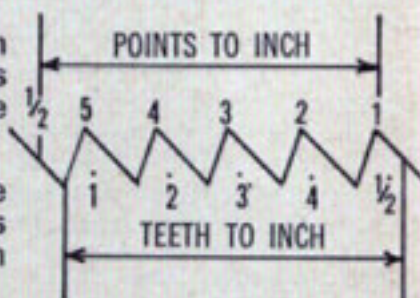
1. Side elevation of teeth seen from slightly ahead showing square leading edges and chisel points.
2. Edge view of teeth.

give clearance. This set, on each side, must NOT be greater than one-third of the thickness of the blade. For accurate set, use .014" per side.

POINTS TO THE INCH

The size of the teeth in a saw is determined by points to the inch, as shown in the illustration below.

Disston rip saws are made $4\frac{1}{2}$ points and $5\frac{1}{2}$ points to the inch in the 26-inch length.



LENGTH OF BLADES

Blade length of both rip and cross-cut hand saws are measured from point to butt on the cutting edge. Rip saws are made 26 inches in length.

HOW TO SHARPEN A HAND SAW

A Disston Saw is a fine tool, accurately made by skilled craftsmen, and will give a life-time of service if properly handled. Use it as a fine tool should be used. When necessary to set and file it, follow these instructions carefully. Then, as you work, read them step by step.

1. Examine the tooth-edge of your saw to see if teeth are uniform in size and shape, and that they are properly set. It is not necessary to reset the teeth of a well-tempered hand saw every time it needs sharpening. If the teeth are touched up with a file from time to time as the saw is used the saw will cut longer and better, and sufficient set will remain to enable the saw to clear itself.

2. Study the shape of the teeth. Teeth of saws for cross-cutting should be shaped as shown on page 2. Teeth of saws for ripping should be shaped like those shown on page 4.

A saw cannot give good service unless the teeth are of even, uniform size and properly shaped. If the teeth are uneven, it will be necessary to joint the saw and shape the teeth in accordance with the following instructions:

JOINTING

Jointing means bringing all the teeth to the same height. This need be done only when the teeth are uneven and incorrectly shaped, or when the tooth edge is not straight or is excessively breasted. Unless the teeth are regular in size and shape, it is useless to attempt to set and file a saw.



This illustration is a photographic reproduction showing actual condition of a saw returned to us. This is the manner in which some saws are abused. It is best to have saws, such as this, retooled at the factory.

HOW TO JOINT A SAW

Place the saw in a clamp, handle to the right. Lay a Mill file lengthwise flat upon the teeth. Pass it lightly back and forth the length of the blade, on the tops of the teeth, until the file touches the top of every tooth. If the teeth of your saw are very uneven, it is best not to make all the teeth the same height the first time they are jointed. In this case joint only the highest teeth first, then shape the teeth that have been jointed and joint the teeth a second time. The teeth then will be of equal height. Do not allow the file to tip to one side or the other. Hold it flat.

SHAPING THE TEETH

To be done only when the saw has been jointed. After jointing, all teeth must be filed to the correct shape. The gullets must be of equal depth. The fronts and backs of the teeth must have the proper shape and angle. The teeth must be uniform in size. (Disregard bevel, which will be taken care of later.) To do this, place the file well down in the gullet and file straight across the saw, at right angles to the blade (under no conditions hold the file at any other angle). If the teeth you are filing are of unequal size, press the file against the teeth having the largest tops, until you reach the centre of the flat top made by jointing.

Then move the file to the next gullet, and file until the rest of the top disappears and the tooth has been brought up to a point. Make no effort to bevel the teeth at this time. The teeth, now shaped and of an even height, are ready to be set.

SETTING THE TEETH

As mentioned before, one need not reset the teeth of a well-tempered hand saw every time the teeth need a light sharpening. If it is not necessary to joint and shape the teeth, examine the saw to see if the teeth have the proper amount of set indicated in illustration. If they have proper set, the saw is ready for filing. If they do not, set them in accordance with the following instructions:



CROSS-CUT SAW—Edge view of teeth.



RIP SAW—Edge view of teeth.

AMOUNT OF SET

The amount of set given a saw is highly important because it determines the ease with which the saw runs; it insures accuracy of cutting; and it helps keep the saw sharp for a longer time. The nature and character of the wood to be cut also must be considered. Green or wet wood requires a saw with coarse teeth and wide set, 7 points to the inch, while a 10 point saw with light set will work better in dry, well-seasoned lumber. For ordinary cross-cutting, the user will find the 6, 7 or 8 point most in demand.

CROSS-CUT

Cross-cut saws are set .012" per side and panel saws .010" per side. Where accurate means of measuring are not available, it is important to remember that the set must not be greater than 1/3 of the blade thickness.

DEPTH OF SET

Whether the saw is fine or coarse, the depth of the set should not go lower than half the tooth. This is important. If deeper than this it is likely to spring, crimp or crack the blade, if it does not break out a tooth.

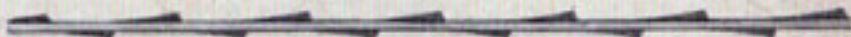
A taper ground saw requires very little set, for the blade, being of uniform thickness along the entire tooth edge, tapers thinner to the back and also tapers from butt to point along the back which provides the measure of clearance necessary for easy running.

USING A SAW SET

The general practice, outside a saw factory, is to set the teeth by bending over the point of tooth by pressure with a special tool known as a saw set. Many so called saw sets are impractical; they give too deep a set, or the pressure is improperly applied.

CAUTION: DO NOT OVER SET. Start at 2 graduations lower than points of saw and check for amount of set. Increase if necessary.

In setting teeth, particular care must be taken to see that the set is regular. It must be the same width from end to end of the blade, and the same width on both sides of the blade, otherwise the saw will not cut true, it will run out of line and the cut will be "snaky". Frequently, complaints have been made that the saw is soft and will not hold an edge, when the main trouble is the irregularity of the width of the set.



Looking from back of saw, this shows how the teeth, when set, extend beyond the sides of the blade.

FILING THE TEETH

Necessary Equipment. The only equipment necessary consists of a clamp and files. The clamp should be sufficiently strong to hold the blade firm enough to prevent chattering, and one in which the blade can be placed and tightened easily and quickly. The top of the clamp should be on a line with the operator's elbows for best working position.

The following table indicates the file to be used:

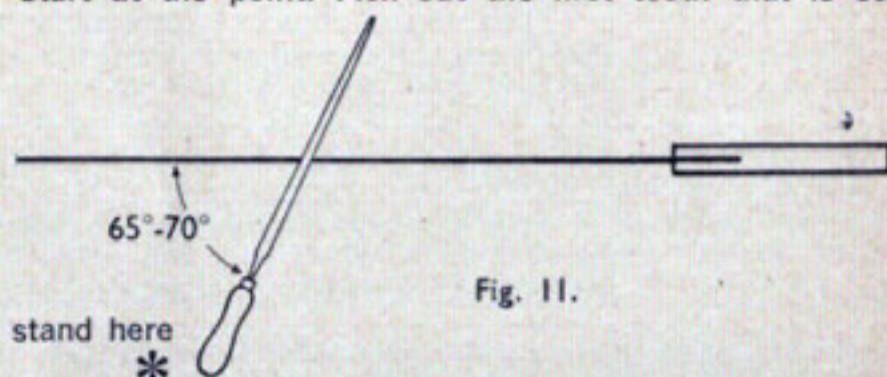
4½, 5½, 6 points	—	7 inch Slim Taper
7, 8 points	—	6 inch Slim Taper
10 points	—	5 or 6 inch Slim Taper
13 points	—	4½ inch Slim Taper
Jointing teeth	—	8 or 10 inch or Mill Bastard

To determine the point of a saw refer to pages 3 and 4.

Place the saw in filing clamp **WITH HANDLE AT RIGHT**. The bottom of the gullets of teeth should be 1/8 inch above the jaws of the clamp. If more of the blade projects, the file will chatter or screech. This dulls the file quickly. It will assist you to file a saw properly, if at the start, you pass a file lightly down the tops of the teeth (just as instructed under "How to Joint a Saw" on opposite page) to form a **VERY SMALL** flat top on each tooth. The purpose of this is to provide a guide for filing. It does, however, again even up the teeth—which is the main purpose of jointing. Now, file the teeth as instructed in the following paragraphs:

FILING HAND SAWS FOR CROSS-CUTTING

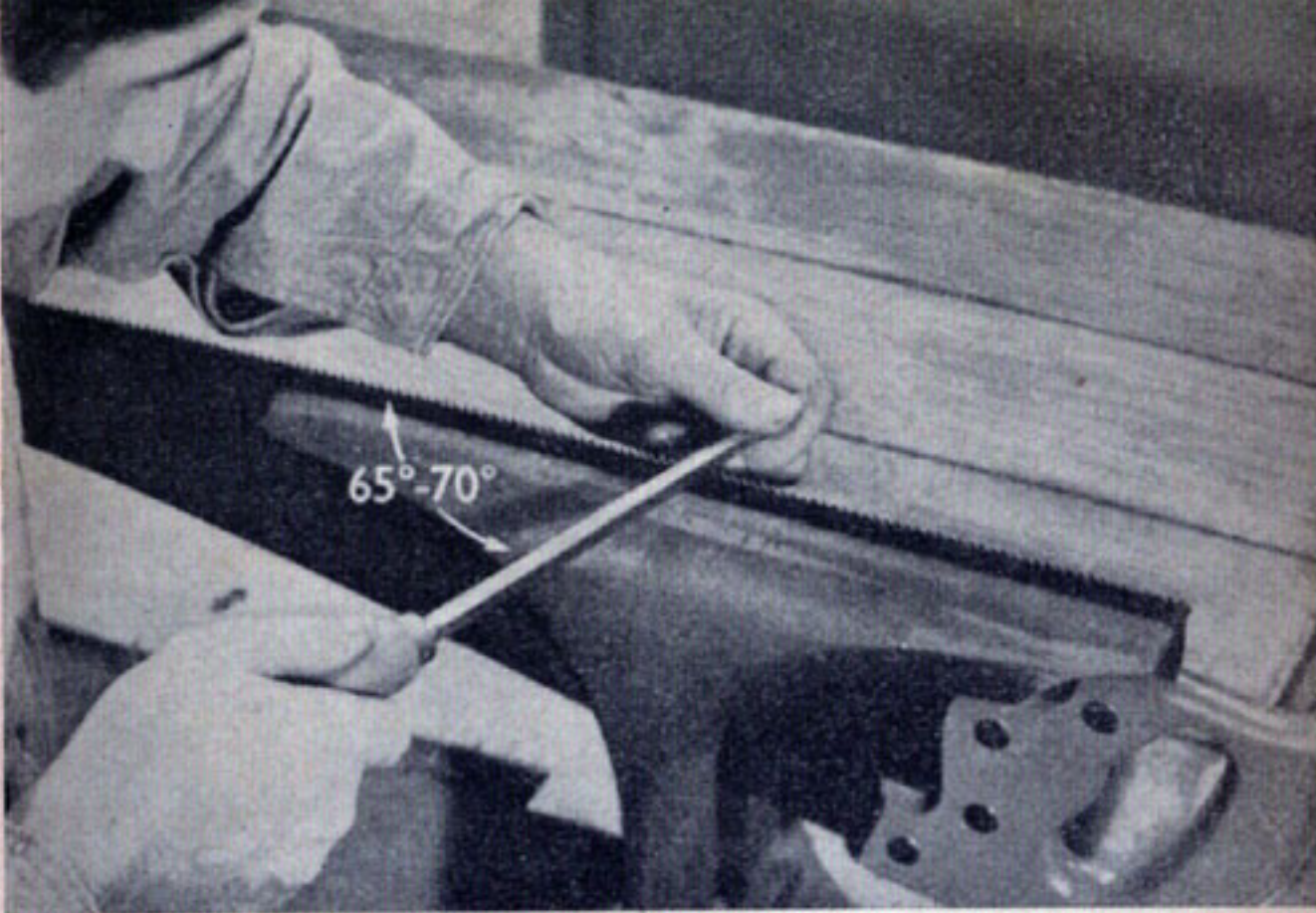
Stand at first position, illustration shown below. Start at the point. Pick out the first tooth that is set



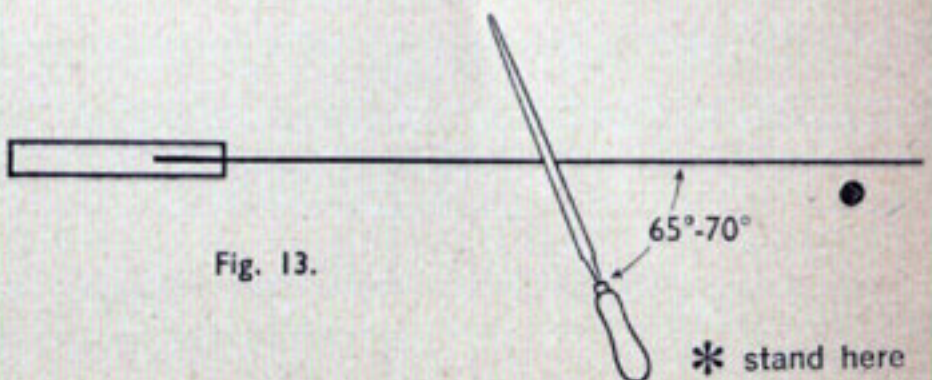
First position for filing hand saws for cross-cutting.

toward you. Place file in the gullet to the **LEFT** of this tooth. Hold file directly across the blade. Then swing the file handle toward the **LEFT** to the desired angle. Illustration above shows the correct angle.

Hold the file level and at this angle. Do not allow file to tip upward or downward. Be sure the file sets down well into the gullet. Let it find its own bearing against the teeth it touches. It will help the beginner if he will first observe the shape and bevel of some of the unused teeth that can most always be found near the handle-end



of a saw. If these teeth are shaped as they left the factory, they will serve as a guide. The file should cut on the push stroke. It files the back of the tooth to the left and the front of the tooth to the right at the same time. File the teeth until you cut away one-half of the flat tops you made on the teeth as a guide, then lift the file from the gullet. Skip the next gullet to the right and place the file in the second gullet toward the handle. Repeat the filing operation on the two teeth the file now touches, being careful to file at the same angle as before. Continue this way, placing the file in every second gullet, till you reach the handle-end of the saw.



Second position for filing cross-cut saws.

Study the second position illustration shown above before you go further. Turn the saw around in the clamp, **HANDLE TO THE LEFT**. Take second position. Place the file in the gullet to the **RIGHT** of the first tooth set

FILING HAND SAWS FOR RIPPING

TOWARD you. This is the first of the gullets you skipped when filing the other side of the saw. Turn file handle to the desired angle toward the RIGHT. Now file until you cut away the other half of the flat top made on the teeth as a guide and the teeth are sharpened to a point. Continue this, placing file in every second gullet, until you reach the handle of the saw.

With one exception, this operation is exactly the same as that given for cross-cut saws.

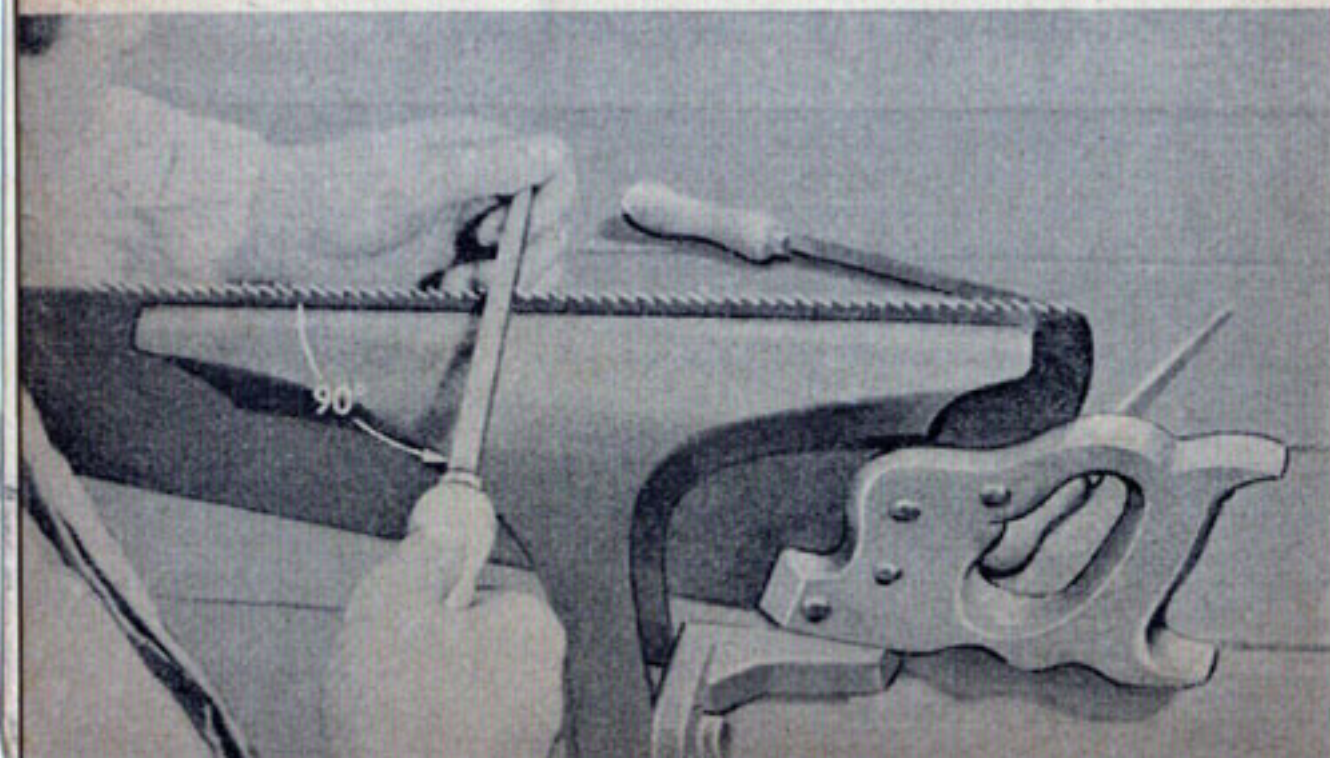
This exception is that rip saws are filed with the file held STRAIGHT ACROSS the saw, at a right angle to the blade. The file should be placed in gullet so as to keep the angle on the front of each tooth 8° at front, 52° at back.

Place the saw in clamp with handle toward the right. Start at the point. Place the file in the gullet to the left of the first tooth set toward you.

Continue, placing file in every second gullet and filing straight across. When handle of saw is reached in this way, turn saw around in the clamp. Start at point again, placing file in first gullet skipped when filing from other side. Continue to file in every second gullet until handle-end of saw is reached.

In reading this part of the saw filing instructions, the inexperienced user may be tempted to save the trouble of turning the saw around in clamp and try to file all teeth from the same side of the blade. Don't do it—this practice is one of the things that makes saws run to one side. This should never be done either with the rip saw or with a cross-cut saw.

In filing teeth, use care to see that in the final sharpening, all the teeth are of the same size and height, otherwise the saw will not cut satisfactorily, as the teeth being of uneven sizes will place the strain only on the larger or higher teeth, and will cause the saw to jump or bind in the kerf; this will in many cases kink the blade, throwing it out of true.

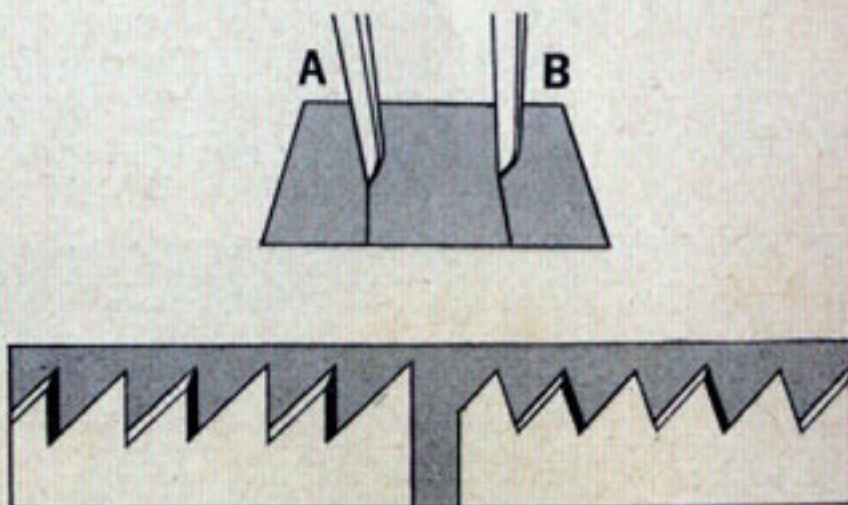


PROPER SHAPE AND ANGLE OF SAW TEETH

Previously, the angles of cross-cut and rip teeth were described. However, some additional information may be of use. The angle of the tooth is one of the most important features and too much care cannot be taken to have the correct angle for the duty required.

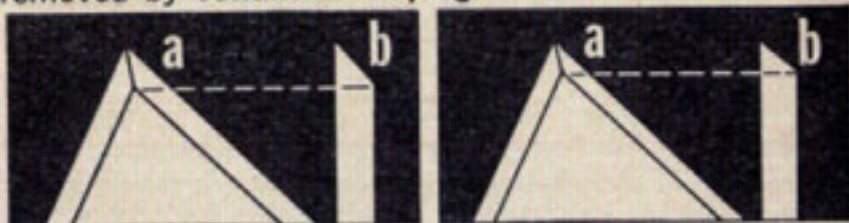
Imagine the accompanying illustration as representing a board, across which you wish to make a deep mark with the point of a knife. Suppose we hold the knife nearly perpendicular as at B. It is evident that it will pull harder and will not cut as smoothly as if it were inclined forward as at A. It follows, then, that the cutting edge of the cross-cut saw should be at an acute angle as at C, rather than stand perpendicular as at D.

The angles 15° front and 45° back are for cross-cut saws; and 8° front and 52° back for rip saws, as the saws are made at factory, will prove most satisfactory for general use. When a saw has less angle at the front of the teeth than these recommendations, it is said to have hook or pitch. If too much hook is given to the teeth, the saw often takes hold too keenly causing it to "hand up" suddenly in the cut — resulting sometimes in a kinked blade. When there is too much set, the teeth may be broken, because the strain caused by the unnecessary amount of set is out of proportion to the strength of the blade. In filing saws for cross-cutting, the file is held at an angle, therefore, the teeth are given an angle on the front and back of the teeth which is called bevel.



BEVEL OF THE TEETH

The proper amount of bevel to give the teeth is very important, for if there is too much bevel, the point will score so deeply that the fibres severed from the main body will not crumble out as cut, but must be removed by continued rasping.



The illustration, first figure above, shows a tooth (enlarged) of a cross-cut saw with the same amount of bevel front and back. This saw, with long front, B is best suited for work in soft woods where rapid, rather than fine work is required.

The second illustration shows a tooth (enlarged) of a saw for medium hardwoods. This tooth has less bevel on the back which gives a shorter bevel to the point, as at B.

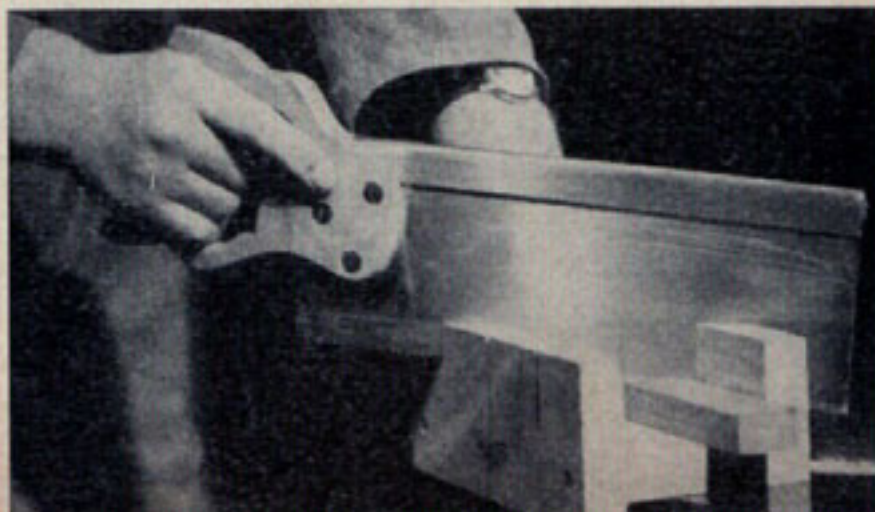
It will be seen from these illustrations that the bevel on the front of the teeth is about the same, but the bevel on the point looking the length of the saw is quite different, depending upon the difference in the angles of the backs of the teeth. Here again, experience will indicate what is best. For the beginner, we recommend that the instructions given under "Filing the Teeth" be followed carefully.

THE BACK SAW OR TENON SAW

Disston back saws are made of the same fine steel as Disston hand saws. They have the famous Disston temper and edge-holding qualities so vital to the craftsworker who wants high quality tools.

In using a back saw in a mitre box, be sure the cut lines up with the slots in the box. Hold work against back of box and start cut carefully with a back stroke, holding handle of saw slightly upward. Gradually level the saw and continue cutting with the blade horizontal.

If a mitre box is not used, it is advisable to support the work with a bench hook. In making mortises, keep saw level after starting cut, and watch depth at both ends of cut. To sharpen a back saw, use a 4- or 5-inch Disston Extra Slim Taper File. The set per side is .008".





DISSTON

Superior Quality

HAND SAWS

SELECTION CHART

TYPE	DESCRIPTION	POINTS TO INCH	LENGTH
D95	Top quality. Where only the very best will do. Taper Ground.	7, 8, 10 CROSSCUT	26"
		5½ RIP	26"
D8	Top quality Tradesman Saw. Taper Ground.	6, 7, 8 CROSSCUT	26"
		10 PANEL	22"
		4½ RIP	26"
D51 ALL CUT	Fescol Hard Chrome teeth. Hard-working, multi-purpose.	8 PT. CROSSCUT	24"
K6	For man with home workshop. Taper Ground.	6, 7, 8 CROSSCUT	26"
		10 PANEL	22"
		4½ RIP	26"
IMPERIAL 600	The Householders' saw.	6, 7, 8 CROSSCUT	26"
		10 PANEL	22"
		4½ RIP	26"
CHALLENGER	The saw for that odd occasion.	7 CROSSCUT 10 PANEL	26" 20"
No. 4 BACKSAW	Top quality saw for mitring and fixing.	13	10," 12," 14"
K1 BACKSAW	Handyman's saw for mitring and fixing.	13	10," 12," 14"
BOWSAW	For pruning limbs and odd jobs. Replaceable blades.	FAST CUTTING TOOTH STYLE	21," 24" 30", 36"
DPI PRUNING SAW	For general pruning.	FAST CUTTING TOOTH STYLE	11"
D100	Design winning, top quality.	7 PT.	26"
No. 4	Mitre Box.	13 PT.	24"

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